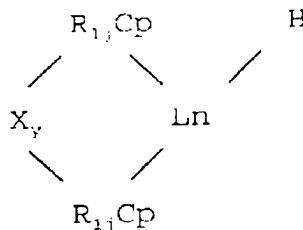


NEW CLAIMS

Applicants : Desurmont et al.
Int'l App. No. : PCT/FR00/00614
Int'l Filing Date : March 14, 2000
Our Ref. : 6680-010

26. A method of preparing block copolymers, comprising the steps of polymerizing a first monomer consisting of an alpha-olefin containing from 3 to 20 carbon atoms into a first, isotactic block, using a catalyst, then polymerizing at least one second monomer, said catalyst being in the form of a hydride complex of a trivalent metal from the rare earth group, having the formula I:



in which:

Cp is a cyclopentadienyl radical;

R_{1j} , identical or different at each occurrence, is a substituent of the cyclopentadienyl group and is an alkyl radical or a silicon-containing hydrocarbon radical, unsubstituted and containing from 1 to 6 carbon atoms;

j , identical or different at each occurrence, is 1, 2 or 3;

X is a divalent alkylene radical containing from 1 to 20 carbon atoms or $\text{Si}(\text{R})_2$ in which R is an alkyl radical having from 1 to 4 carbon atoms;

y is 1 or 2;

Ln is Y or Sm .

27. The method as claimed in claim 26, wherein, in the formula I, R_{1j}Cp is the group $2\text{-Me}_3\text{Si}, 4\text{-Me}_2\text{tBuSiCp}$ or the group $2\text{-Me}_3\text{Si}, 4\text{-tBuCp}$.

28. The method as claimed in claim 26, wherein the catalyst is $\text{Me}_2\text{Si}(2\text{-Me}_3\text{Si}, 4\text{-Me}_2\text{tBuSiCp})_2\text{YH}$ or $\text{Me}_2\text{Si}(2\text{-Me}_3\text{Si}, 4\text{-tBuCp})_2\text{SmH}$.

29. The method as claimed in claim 26, wherein the catalyst is racemic.

30. The method as claimed in claim 26, wherein the catalyst is generated in situ in the presence of at least one portion of the first monomer.

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31. The method as claimed in claim 26, wherein the catalyst is prepared by hydrogenation of the alkyl precursor.

32. The method as claimed in claim 26, wherein the blocks are homopolymers or random copolymers.

33. The method as claimed in claim 26, wherein the block copolymer comprises a block of the second monomer which is a vinyl, vinylidene or lactone compound.

34. The method as claimed in claim 33, wherein the vinyl or vinylidene compound is represented by the formula $H_2C=CR'Z$ in which R' is hydrogen or an alkyl radical having from 1 to 12 carbon atoms and Z is an electron-withdrawing radical.

35. The method as claimed in claim 34, wherein the vinyl or vinylidene compound is an ester of an unsaturated carboxylic acid.

36. The method as claimed in claim 33, wherein the poly-alpha-olefin is crystalline.

37. The method as claimed in claim 26, wherein the second monomer is polar.

38. The method as claimed in claim 26, for preparing a poly-alpha-olefin/PMMA or poly-alpha-olefin/polylactone copolymer.

39. The method as claimed in claim 26, wherein the block copolymer comprises a block of the second monomer which is an alpha-olefin.

40. The method as claimed in claim 39, wherein the first poly-alpha-olefin is crystalline and the second poly-alpha-olefin is crystalline.

41. The method as claimed in claim 40, for preparing a PP/PE copolymer.

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42. The method as claimed in claim 38, wherein the first poly-alpha-olefin is crystalline and the second poly-alpha-olefin is amorphous.

43. The method as claimed in claim 42, for preparing a PP/EP copolymer.

44. The method as claimed in claim 26, wherein the block copolymer comprises a first iPP block.

45. The method as claimed in claim 26, wherein the catalyst is racemic and is generated in situ in the presence of at least one portion of the first monomer.

46. The method as claimed in claim 45, wherein the catalyst is prepared by hydrogenation of the alkyl precursor.

47. A copolymer comprising a first block of a crystalline polyolefin derived from an alpha-olefin containing from 3 to 20 carbon atoms and a second block of an amorphous polyolefin, with the exception of a PP/EP copolymer having a molecular mass Mn of less than or equal to 16 000 and a polydispersity index of between 3 and 3.3.

48. The copolymer as claimed in claim 47, which is a PP/EP copolymer.

49. The copolymer as claimed in claim 47, wherein the first block is isotactic.

50. The copolymer as claimed in claim 47, wherein the blocks are homopolymers or random copolymers.

51. A copolymer comprising a first block of a crystalline polyolefin derived from an alpha-olefin containing from 3 to 20 carbon atoms and a second block of a crystalline polyolefin.

52. The copolymer as claimed in claim 51, wherein the first block is isotactic.

53. The copolymer as claimed in claim 51, wherein the blocks are homopolymers or random copolymers.

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54. A copolymer comprising a first block of an amorphous polyolefin derived from an alpha-olefin containing from 3 to 20 carbon atoms and a second block of an amorphous polyolefin.

55. The copolymer as claimed in claim 54, wherein the blocks are homopolymers or random copolymers.

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END